

What is claimed is:

1. A method of expanding human bone marrow CD34+CD38- hematopoietic progenitor cells, including primitive stem cells, comprising the steps of:
 - i) contacting the isolated CD34+CD38- hematopoietic progenitor cells with human brain endothelial cells; and
 - ii) co-culturing the contacted CD34+CD38- hematopoietic progenitor cells and endothelial cells in the presence of at least one cytokine in an amount sufficient to support amplification/expansion of said CD34+ stem and progenitor cells.
2. A method of expanding human bone marrow CD34+CD38- hematopoietic progenitor cells, including primitive stem cells, in vitro comprising the steps of:
 - i) isolating the CD34+CD38- hematopoietic progenitor cells from human bone marrow;
 - ii) contacting the isolated CD34+CD38- hematopoietic progenitor cells with human brain endothelial cells; and
 - iii) co-culturing the contacted CD34+CD38- hematopoietic progenitor cells and endothelial cells in the presence of at least one cytokine in an amount sufficient to support amplification/expansion of said CD34+ stem and progenitor cells.
3. The method of Claim 1 or 2, wherein said expansion is in-vitro.
4. The method of Claim 1 or 2, wherein said expansion is ex-vivo.
5. The method according to claim 1 or 2, wherein said CD34+CD38- hematopoietic progenitor cells are contacted with a semi-confluent monolayer of the endothelial cells.
6. The method according to claim 1 or 2, wherein said cytokine is selected from the group consisting of a mixture of granulocyte-macrophage colony stimulating factor and stem cell factor; a mixture of interleukin-3, stem cell factor, and interleukin-6; a mixture of granulocyte-macrophage colony stimulating factor, interleukin-3, stem cell factor, and interleukin-6; and combinations of these mixtures.

7. The method according to claim 6, wherein said cytokine is a mixture of granulocyte-macrophage colony stimulating factor, interleukin-3, stem cell factor and interleukin-6.

8. The method according to claim 6, wherein said cytokine is granulocyte-macrophage colony stimulating factor.

9. A method of engrafting human bone marrow CD34+CD38- hematopoietic progenitor cells in a human, the method comprising the steps of:

i) contacting the isolated CD34+CD38- hematopoietic progenitor cells with human brain endothelial cells containing a factor or factors that expand the CD34+CD38- hematopoietic progenitor cells;

ii) co-culturing the contacted CD34+CD38- hematopoietic progenitor cells and endothelial cells in the presence of at least one cytokine in an amount sufficient to support amplification/expansion of said CD34+CD38- hematopoietic progenitor cells;

iii) isolating the amplified/expanded CD34+CD38- hematopoietic progenitor cells from the culture; and

iv) infusing the amplified/expanded CD34+CD38- hematopoietic progenitor cells into said human.

10. A method of engrafting human bone marrow CD34+CD38- hematopoietic progenitor cells in a human, the method comprising the steps of:

i) isolating CD34+CD38- hematopoietic progenitor cells from human bone marrow;

ii) contacting the isolated CD34+CD38- hematopoietic progenitor cells with human brain endothelial cells containing a factor or factors that expand the CD34+CD38- hematopoietic progenitor cells;

iii) co-culturing the contacted CD34+CD38- hematopoietic progenitor cells and endothelial cells in the presence of at least one cytokine in an amount sufficient to support amplification/expansion of said CD34+CD38- hematopoietic progenitor cells;

iv) isolating the amplified/expanded CD34+CD38- hematopoietic progenitor cells from the culture; and

v) infusing the amplified/expanded CD34+CD38- hematopoietic progenitor cells into said human.

11. The method according to Claim 9 or 10, wherein said cells are isolated from the bone marrow of the human.
12. The method according to Claim 9 or 10, wherein said cells are isolated from the bone marrow of the human in need of said CD34+CD38- hematopoietic progenitor cells.
13. The method according to Claim 9 or 10, wherein said CD34+CD38- hematopoietic progenitor cells are isolated from the bone marrow of a donor.
14. A method of amplifying/expanding human CD34+CD38- hematopoietic progenitor cells which comprises the steps of:
 - i) contacting the isolated CD34+CD38- hematopoietic progenitor cells with human brain endothelial cells; and
 - ii) co-culturing the contacted CD34+CD38- hematopoietic progenitor cells and endothelial cells in the presence of a mixture of granulocyte-macrophage colony stimulating factor, interleukin-3, stem cell factor and interleukin-6 in an amount sufficient to amplify/expand said CD34+CD38- hematopoietic progenitor cells.
15. A method of amplifying/expanding human CD34+CD38- hematopoietic progenitor cells which comprises the steps of:
 - i) isolating CD34+CD38- hematopoietic progenitor cells from human bone marrow;
 - ii) contacting the isolated CD34+CD38- hematopoietic progenitor cells with human brain endothelial cells; and
 - iii) co-culturing the contacted CD34+CD38- hematopoietic progenitor cells and endothelial cells in the presence of a mixture of granulocyte-macrophage colony stimulating factor, interleukin-3, stem cell factor and interleukin-6 in an amount sufficient to amplify/expand said CD34+CD38- hematopoietic progenitor cells.
16. The method of Claim 14 or 15, wherein said expansion is in-vitro.
17. The method of Claim 14 or 15, wherein said expansion is ex-vivo.
18. A growth medium for cell expansion comprising human brain endothelial cells and a cytokine selected from the group consisting of granulocyte-macrophage colony stimulating factor, interleukin-3, stem cell factor and interleukin-6, flt3-ligand and combinations thereof.

19. A growth medium according to Claim 18 further comprising a cytokine selected from the group consisting of granulocyte-macrophage colony stimulating factor, interleukin-3, stem cell factor and interleukin-6, flt3-ligand and combinations thereof.
20. The growth medium of Claim 18, said medium comprising a monolayer of human brain endothelial cells.